

***Implementation and Sustainment of an EMS
“High Reliability Organization” in the District of Columbia***

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Testimony before the D.C. Mayors Emergency Medical Service Task Force

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Good afternoon and thank you for the invitation to speak before the D.C. Emergency Medical Service Task Force.

Emergency Medical Services (EMS) personnel treat more than 20 million patients a year in the United States¹. Many of these patients have complicated medical illnesses or traumatic injuries that require EMT's and Paramedics with substantial knowledge, professional skills and first-rate clinical judgment if they are to be treated properly and effectively. Other patients are critically ill or injured, and an effective professional EMS response and intervention can literally mean the difference between life and death. Many patients EMS will be called to assist will not be for a life or death situation, but it is no less significant to these patients, their family or neighbors. Regardless of the nature or severity of the illness or injury the expectation relative to the EMS response is that it will be timely and professional and the services rendered will be consistent with the contemporary “standard of care”.

EMS provides out-of-facility medical care and it is a component of the overall health care system. EMS delivers treatment as part of, or in combination with, systematic approaches intended to attenuate morbidity and mortality for specific patient subpopulations². Effective and sustainable delivery of Emergency Medical Services in any community is a challenging task but it is an especially complex undertaking in a high volume urban response environment.

The urban EMS environment is often complicated with unique challenges and negative operational influences that must be managed aggressively and daily, including but are not limited to: large fluctuations in service demands; extended vertical and below grade access to patients, increasing response /patient contact interval; personnel recruitment and retention woes in some cases originating from an organizations reputation dissuading possible candidates, inadequate compensation and pension benefits and a very competitive employment market where some communities are offering incentives ranging from transfer of pension credit & relocation packages³ to signing bonuses (some as large as \$10,000^{4,5}) and increased longevity pay^{6,7,8} bonuses for EMS professionals.

¹ NHTSA OEMS – EMS Agenda for the Future

<http://www.nhtsa.dot.gov/people/injury/ems/agenda/emsman.html#ATTRIBUTES>

² IBID

³ Columbus, Georgia <http://ccga1.columbusga.org/CCGJobVacancies.nsf>

⁴ City of Memphis Fire Services Division

http://www.cityofmemphis.org/pdf_forms/FireJobPostings/firefighterParamedicJobPosting2.pdf

http://cms.firehouse.com/jobs/memphis_07.jsp

⁵ Columbus Georgia <http://ccga1.columbusga.org/CCGJobVacancies.nsf>

⁶ City of Memphis Fire Services Division (see #3)

⁷ University City, MO <http://www.ucitymo.org/DocumentView.asp?DID=199>

⁸ Dare County, NC <http://www.co.dare.nc.us/depts/ems/empl.htm>

Regardless of the EMS operating environment or delivery model configuration the foundational success of an EMS organization will hinge upon three basic organizational principals:

- Value the EMS Mission
- Appropriately Resource the EMS Operation
- Respect the Individuals Who are Executing the Mission

Metaphorically, EMS organizations are like a three legged stool – each of the aforementioned tenets represents a leg in that stool. Failure to fully understand the importance of these principals and how they will directly influence the success of your EMS operation and performance outcomes could prove to be a fatal flaw with that stool toppling over to the floor. Demonstrating that the EMS mission is valued -- from the very top levels of governance to the EMS responder in the medic unit, providing appropriate levels of resources required to achieve the mission and making your EMS members truly feel that they are respected and part of the “team” will establish a firm foundation to build and enhance the District of Columbia EMS remediation and capacity building effort. These three basic tenets must become institutionalized as the prevailing organizational philosophy.

On May 19, 2004, D.C. Fire & EMS hosted the first Regional EMS Forum with facilitation of the meeting via the Center for Excellence in Municipal Management (CEMM) and the Institute for Crisis, Disaster, and Risk Management (ICDRM) at the George Washington University. On July 6, 2004 the Report on the First Regional EMS Forum – National Capital Area was published by Lead Authors Dr. Joseph Barbera MD and Laura Olson MA. In that document the authors report some compelling observations that most likely will be germane to your continued deliberations and of value to those discussions. One such observation was:

A recurring criticism was that in the combined system, the EMS element often is subject to attempts to solve EMS problems with Fire solutions. This criticism deserves greater scrutiny. A persistent question that carried through this concern is, ‘Do managers have the experience to make decisions on Fire or EMS if they are embedded in the culture of opposite division’? Many statements about understanding “fire management” and “EMS management” as separate entities in terms of incident and personnel management were made and suggested that a closer examination of this predominant EMS management paradigm is necessary. Even if management itself is quite satisfied with the basis for their decision-making and systemic lay-out, it may be important to revisit this issue, as significant concern about upper-level decision-making emanated from within the ranks and from the EMS community at all levels. The impression that EMS professionals feel that their input is undervalued in EMS-related decision-making became very apparent⁹.

⁹ Report on the First Regional EMS Forum – National Capital Area (Barbera & Olson 7/6/04)
<http://www.gwu.edu/~icdrmpublications/PDF/FORUM%20Regional%20EMS%20Forum%20REPORT%20FINAL%206%20JULY%2004%20posted.pdf>

Report Findings: Professional Standards/Competencies, Compliance and the Standard of Care Issues

Over the course of two decades there has been a significant amount of money and time expended on commissioned reports and investigations that examined the issues that currently confront EMS in the District of Columbia. Some of these commissioned reports and investigations were conducted by DC Government agencies, others by external resources such as consulting firms and Universities. In most cases these commissioned reports and investigations were engendered by problems that emerged after a 911 response; problems that justifiably sparked public outcry and media scrutiny of the quality of EMS service rendered.

Parenthetically, these commissioned reports and investigations produced many good ideas and resolution strategies that have not been implemented. I cannot provide a reason or rationale for what appears to be a pattern of inaction and neglect, I can only tell you that problems were identified, efforts to investigate the problems were undertaken, resolution strategies were presented for consideration, and that an overwhelmingly majority of these solutions were not acted upon.

In this day and age, with tremendous strides being made in medicine and health care, a community needs to adopt a uniform definition of EMS competency, and the public deserves to be assured that the jurisdictional authority for EMS is doing everything to engender an organizational environment that is conducive to achieving that goal; that all EMS providers have met the defined standard and perform their duties at that defined level on each and every emergency scene. This goal is achieved in part by insuring an adequate level of supervision on-duty each day, supervisors that are knowledgeable in EMS operations, possesses current EMS certifications and can function effectively as an advocate and mentor for their EMS team members. Unfortunately, this seems to be a continuing and significant shortcoming that needs to be addressed. Drawing once again upon the 7/6/04 - Report on the First Regional EMS Forum we find additional compelling observations related to supervision issues:

Many participants conveyed that they weren't getting enough of the right kind of supervision, with too many bosses and each with his or her own vision. Field providers felt that unless their superiors had EMS experience, and could do their job if needed, they were an ineffective source of oversight since they didn't fully understand everything that the provider is up against. This poses a significant problem, because, as one participant noted, most of the administrative staff had no such experience. This may be a particularly acute problem in fire department-based EMS systems, in which fire officials who lack any personal EMS experience or training supervise EMS personnel¹⁰.

While I am fully cognizant that these were "regional" meetings, the forum was commissioned by the District of Columbia and DCFEMS had a respectable presence at the forum participating in these discussions. These issues are too important to be dismissed and must be examined for resolution if the goal of an EMS High Reliability Organization is to be realized – regardless of the organization service delivery model that is eventually determined for utility in the District.

¹⁰ IBID

Professional operating and training standards are the hallmark of contemporary professional EMS operations. Collectively they support achieving the penultimate requirement of the adopted EMS “standard of care” for the EMS employee and the community at large. There are many standards that EMS must fulfill in order to accurately proclaim “compliance”. Standards the contemporary EMS executive must address include but are not limited to:

- NHSTA National Standard Curriculums
- NHTSA Scope of Practice
- OSHA
- EPA
- NFPA
- EMTALA
- HIPPA
- CMMS
- HSPD’s
- State/Local Regulatory or Statutory Requirements
- Agency Treatment Protocols

In each of these areas of defined standards the required specifications of competencies are well articulated and range from training content, required skills sets, response equipment and in the case of agency treatment protocols; establishing the “standard of care” that patients will expect to receive in their time of need.

While participating in Councilmember Mendelsons’ – Judiciary Committees’ DC EMS Commission activities the Commission members have encountered situations that are of concern regarding some of these compliance matters. For instance, during one meeting’s discussion about supervisory personnel, the technical issue of how a supervisor conducts an investigation arose – when we inquired about what investigatory training supervisors had been provided to support their responsibilities to conduct investigations in an objective manner and to support the department professionally in the discharge of their duties – we were advised that EMS supervisors do not receive training in this area – but they are expected to perform this duty.

At another meeting when we were discussing compliance with OSHA 1910.120(e)(7), (e)(8),¹¹, EPA 311¹², HMTUSA EMS Level 1 & 2¹³ and NFPA 472¹⁴ (Standard for Professional Competence of Responders to Hazardous Materials Incidents), 473¹⁵ (Standards

¹¹ 29CFR1910.120 Hazardous waste operations and emergency response
www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=9765

¹² EPA 311 <http://yosemite.epa.gov/oswer/ceppoweb.nsf/content/epcraOverview.htm>

¹³ HMEP HMTUSA <http://hazmat.dot.gov/regs/notices/nprm/hm/hm208c.htm>

¹⁴ NFPA 472 Standard for Professional Competence of Responders to Hazardous Materials Incidents
<http://homeland.ca.gov/pdf/nfpa472.pdf>

¹⁵ NFPA 473 Standards for Competencies for EMS personnel Responding to Hazardous Materials Incidents
<http://homeland.ca.gov/pdf/nfpa473.pdf>

for Competencies for EMS personnel Responding to Hazardous Materials Incidents), we were advised that the EMS personnel are not provided training to the operations level in compliance with those standards. Competency in this area is a requirement to keep the EMS responder safe, compliance is not an option but a life safety requirement. Continued competency across the EMS skill set is an essential component of the certification process and needs to be consistently and competently addressed to ensure member and public safety.

Some would argue that increased EMS competencies over the years are contributing to the recruitment and retention problems. The National Registry of EMT's in response to the IOM EMS report recently released reported that: "There is no empirical evidence that increasing standards of competency decreases the size of the EMS workforce. In addition, decreasing the standards in an effort to gain a larger workforce does not provide the American public with the competency they deserve¹⁶."

The standard of care for EMS is derived from a variety of sources including the NHTSA National Standardized Training Curricula, the National EMS Scope of Practice Model and local EMS Treatment Protocols.

The *National EMS Scope of Practice Model* is part of the National Highway Traffic Safety Administration's commitment to the *EMS Agenda for the Future*. Released in 1996, the *EMS Agenda for the Future* established a long-term vision for the future of emergency medical services in the United States. According to the *Agenda*, Emergency Medical Services (EMS) of the future will be community based health management that is fully integrated with the overall health care system. It will have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring. This new entity will be developed from redistribution of existing health care resources and it will be integrated with other health care providers and public health and safety agencies. It will improve community health and result in a more appropriate use of acute health care resources. EMS will remain the public's emergency medical safety net¹⁷.

In DC the standard of care is defined by the District of Columbia Adult and Pediatric Pre-Hospital Medical Protocols

District of Columbia Adult Pre-Hospital Medical Protocols

Introduction

¹⁶ http://www.nremt.org/about/article_00034_IoM_Response.asp NREMT Responds to the IoM Report By Gregg Margolis, PhD., NREMT-P Posted 06/27/2006

¹⁷ National EMS Scope of Practice Model

nhtsa.gov/.../DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/EMS_Feb07_PMS314.pdf

The District of Columbia Adult Pre-Hospital Medical Protocols define how Emergency Medical Technicians (EMTs) and Paramedics are allowed to treat patients in the field. The purpose of the protocols is to provide guidance to the EMT and Paramedic when providing the appropriate care to a patient.

*The protocols included here cover a wide range of medical and traumatic incidents; including cardiac arrest, gun shot wounds, cyanide poisonings, mass casualty incidents, and more. The protocols delineate the drugs or skill procedures an EMT and/or Paramedic can do under 'Standing Orders' (without direct physician involvement) as well as expanded treatments through 'Medical Control' (through direct voice contact with a physician, the EMT or Paramedic explaining the patient's condition to a physician via radio, and the physician authorizing certain advance treatments). Without the protocols, EMTs and Paramedics would be unable to treat any patient in the field. **It is the EMS field provider's medical bible**¹⁸.*

In addition to describing treatments that the EMTs and Paramedics can provide, it also serves as a reference manual. The protocols include step-by-step instructions on how to perform certain procedures. It also includes a medication reference, describing how a medication works, its indications and contraindications, dosage ranges, and more. Lastly, patient care policies specific to the District of Columbia Fire/EMS Department are included.

The protocols presented here were in development for nearly two years. The review process alone took almost a year. Well over 50 individuals were involved in the development and internal review of the protocols, while over a dozen physicians from the local area hospitals assisted in providing input, review, and oversight.

The protocols are reviewed and approved by the District of Columbia Department of Health. The protocols are considered a living document, for as pre-hospital medicine changes, these protocols will reflect those changes. It is an integral part of the ever-changing world of Emergency Medical Services¹⁹.

Given that these protocols appear to have undergone a significant development process engaging “over a dozen” physicians from local area hospitals and members of the EMS community for “nearly two years” and have been accepted as the “EMS field providers medical bible” – why have more than five years elapsed since adoption with important treatment options, specified in the protocols, not instituted because certain medications are not carried by the units to fulfill the directives? For instance, if as a paramedic confronted with a patient with Ventricular Tachycardia with a Pulse or a Supra-Ventricular Tachycardia (SVT) that most likely will require synchronized cardioversion to correct a life threatening condition, how is the paramedic supposed to effectively and humanely introduce the electric current to convert the rhythm if they can not sedate the patient?. Further, without medics carrying the protocol listed MSO4 – if, as a patient, were having a bout of ischemic chest pain, you would have to wait until arriving at the hospital before getting any pain relief – even though that therapy is sanctioned in the DC protocols. Lastly, what about a child having seizures and in

¹⁸ DC FEMS Protocols <http://fems.dc.gov/fems/cwp/view,a,3,q,582683.asp>

¹⁹ DC FEMS Protocols <http://fems.dc.gov/fems/cwp/view,a,3,q,591209.asp>

status epilepticus? The responding medics will not have diazepam or midazolam to arrest the seizures and possibly prevent further significant and life threatening neurological injuries.

This issue is counter intuitive – if five years after approving the standard of care for DC, through these protocols your Paramedics are not going to carry these basic pharmacological interventions that every other Paramedic system in the nation has been using for years, then why change the protocol and your standard of care. Why would anyone want the liability of having treatment options listed in their protocols and not empower the Paramedics to employ them. While I am not an attorney, I did consult legal counsel and posed this scenario to them. The attorneys responded; “they promulgated and authorized a standard of care and they don’t want to abide by the standard they created? That’s incredible- – standards that direct treatment options, leaving responders without the capacity to fulfill those protocols demonstrate just one aspect of failing to achieve the minimum standards that the agency itself promulgated...negligence per se^{20,21}” As an appendix to this document I have attached the corresponding protocols for your record and review.

Due to the time limitations for testimony I ask that as you conduct your comprehensive review that you consider all matters that directly and indirectly influence the implementation and sustainment of a robust high reliability EMS organization. In addition to the issues I have discussed with you today, other related issues include but are not limited to:

- How response time is calculated – a true snapshot is a calculation that captures from the point the caller makes contact with the 911 operator to the point the EMS crew is at the patients’ side. Calculating response time from the point the wheels are turning to the curb in front of the patients’ house provides little utility.
- Hospital turnaround times
- Staffing of units – EMS started years ago with two people on a crew because one person needed to be in the back with a patient and the other had to drive the unit. 40 years later and 200 pounds of equipment we are still using the same staffing paradigm.
- QA/QI Programs
- Recertification and refresher training issues

As we examine EMS and look for ways to improve existing capacity and capability we do so with an eye to the future to ensure that the District of Columbia will be properly positioned to

²⁰ Telephone interview (5/21/07) D.J. Gilberg JD Esq.

²¹ Negligence per se is the legal doctrine whereby certain acts are considered intrinsically negligent. This occurs when an actor’s violation of a statute (or regulation) causes the kind of harm the statute was intending to prevent. In some jurisdictions, negligence per se creates merely a presumption of negligence. The Restatement (Third) of Torts § 14 (Tentative Draft No. 1, March 28, 2001) addresses negligence per se. Also see Grable & Sons Metal Prods. v. Darue Eng’g & Mfg., 125 S. Ct. 2363, 2370 (2005).

comply with existing and future requirements and adapt to new innovations and advancement in the field of EMS to provide its citizens and visitors with the best possible EMS protection available. The evolution of EMS as the emergency medical safety net for the community is an established fact and will persist into the future. It is the dedicated, compassionate and courageous men and women who respond to the community's calls for help each and everyday that will make achieving the goal of a "world class" EMS for the District of Columbia a reality.

Thank you for your time and interest.

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Adult Cardiac Emergencies: Ventricular Tachycardia with a Pulse

I. All Provider Levels

1. Refer to the Patient Care Protocols.
2. Provide 100% oxygen via NRB, if respiratory effort is inadequate assist ventilations utilizing BVM with 100% oxygen.
3. Place the patient in position of comfort. If evidence of poor perfusion is present place the patient in shock position.
4. Initiate advanced airway management with Combi-tube if respiratory effort is inadequate.



Note Well: EMT-I and EMT-P should use ET intubation.

5. Establish an IV of Normal Saline KVO or Saline lock.



Note Well: An ALS Unit must be en route or on scene.



II. Advanced Life Support Providers

1. Attach EKG monitor and interpret rhythm.
2. If mental status is altered or the patient appears hemodynamically unstable:



- A. Consider sedation option.
 - i. Diazepam (Valium) 2.0 - 5.0 mg IVP
(Medical Control Option Only)



Note Well: In the event of a provider induced diazepam overdose, administer 0.2 mg Flumazenil IV push over 30 seconds, not to exceed 2.0 mg (Medical Control Option Only).

Adult Cardiac Emergencies: Ventricular Tachycardia with a Pulse

II. Advanced Life Support Providers (continued)

- B. Perform Synchronized Cardioversion at 100, 200, 300, 360 joules.
 - i. Reassess patient after every cardioversion.
- C. If patient is unresponsive to the cardioversion attempts, administer Lidocaine 1.5 mg/kg IVP (maximum single dose of 150 mg).



Note Well: Administer Lidocaine 0.75 mg/kg IVP to patients with liver dysfunction, in acute CHF, or over the age of 70.



Note Well: Administration of Lidocaine in the bradycardiac patient may result in complete heart block

- 3. If the patient appears hemodynamically stable without critical signs and symptoms
 - A. Reassess patient every 5 minutes.
- 4. Consider obtaining 12 lead EKG after conversion to a sinus rhythm.



III. Transport Decision

- 1. Transport to the closest appropriate open facility

Adult Cardiac Emergencies: Ventricular Tachycardia with a Pulse



IV. The Following Options are Available by Medical Control Only

1. Cardioversion at 360 joules if rhythm remains unchanged.
2. Defibrillation at 360 joules if rhythm remains unchanged.
3. Diazepam 2.0 - 5.0 mg IVP to a maximum of 10 mg (Reassess every 3 - 5 minutes after administration).
4. Flumazenil, to a maximum dose of 3.0 mg
5. Lidocaine 0.75 mg/kg IVP to a maximum of 3.0 mg/kg (300 mg).

Note Well: Administer Lidocaine 0.75 mg/kg IVP to patients with liver dysfunction, in acute CHF, or over the age of 70.

Note Well: Administration of Lidocaine in the bradycardiac patient may result in the death of the patient

6. Midazolam 1.0 - 2.0 mg IVP to a maximum of 5.0 mg

Adult Cardiac Emergencies: Supraventricular Tachycardia (SVT)



Note Well: This Protocol applies to the patient who has a sustained rate of 150 or greater.

I. All Provider Levels

1. Refer to the Patient Care Protocols.
2. Provide 100% oxygen via NRB, if respiratory effort is inadequate assist ventilations utilizing BVM with 100% oxygen.
3. Place the patient in position of comfort. If evidence of hypoperfusion is present place the patient in shock position.
4. Initiate advanced airway management with Combi-tube if respiratory effort is inadequate.



Note Well: EMT-I and EMT-P should use ET intubation.

5. Establish an IV of Normal Saline KVO or Saline lock.

Note Well: An ALS Unit must be en route or on scene.



II. Advanced Life Support Providers

1. Attach EKG and interpret rhythm.
 - A. Obtain EKG strip and attach to the Patient Care Report
2. Have patient perform a valsalva maneuver

Adult Cardiac Emergencies:

Supraventricular Tachycardia (SVT)

II. Advanced Life Support Providers (continued)

3. If mental status is altered or the patient appears hemodynamically unstable:
 - A. Consider sedation option for cardioversion
 - i. Diazepam 2.0 - 5.0 mg slow IVP
(Medical Control Option Only)
 - B. Perform synchronized cardioversion at 100, 200, 300, 360 joules.
 - i. Reassess patient after every cardioversion
4. If the patient appears hemodynamically stable without critical signs and symptoms:
 - A. Administer 6.0 mg Adenosine fast IVP followed by 20 cc normal saline bolus.
 - i. Reassess patient.
 - B. If after 2 minutes the heart rate has not decreased, administer 12 mg Adenosine fast IVP followed by 20 cc normal saline bolus.
 - i. Reassess patient.
 - C. If after 2 minutes the heart rate has not decreased, administer 12 mg Adenosine fast IVP followed by 20 cc normal saline bolus.
 - i. Reassess patient.
5. Consider 12 lead EKG if possible after conversion to a sinus rhythm.

Note Well: In the event of a provider induced diazepam overdose, administer 0.2 mg flumazenil IV push over 30 seconds, not to exceed 2.0 mg (Medical Control Option Only).

Adult Cardiac Emergencies: Supraventricular Tachycardia (SVT)

H III. Transport Decision

1. Transport to the closest appropriate open facility

C IV. The Following Options are Available by Medical Control Only

1. Cardioversion at 360 joules if rhythm remains unchanged.
2. Diazepam 2.0 - 5.0 mg slow IVP to a maximum of 10 mg
 - A. Reassess every 3 - 5 minutes after administration
3. Flumazenil, to a maximum dose of 2.0 mg
4. Midazolam 1.0 - 2.0 mg IVP to a maximum of 5.0 mg

Medication Reference:

Diazepam (Valium)

Class

- Anticonvulsant.
- Sedative.

Actions

A skeletal muscle relaxant that reduces the incidence and recurrence of seizures, induces hypnosis and sedation.

Indications

- Sustained or recurrent seizures.
- Pre-cardioversion.
- Conscious patient during transcutaneous pacing.

Protocol Reference

B4, B5, B6, D5, E6, F1, G6, P1

**Contraindications**

Hypersensitivity.

Precautions

- Respiratory depression may occur with IV administration.
- Use with caution in pregnant patients, persons ingesting alcohol, or person ingesting sedatives.

Adverse Reactions

- Lightheadedness.
- Ataxia.
- Confusion.
- Slurred speech.
- Impairment of mental and psychomotor functions.

Adult Dosage / Route

2 - 10 mg slow IV push in 2 mg increments over a 2 - 5 minute period.

Medication Reference:

Diazepam (Valium)



Pediatric Dosage / Route

- 0.2 mg/kg slow IVP/IO at a 1mg/minute rate.
 - Maximum total dose of 5.0 mg.
- 0.5 mg/kg rectal dose
 - Maximum total dose of 10.0 mg.

Medication Reference:

Morphine Sulfate

Class

- Narcotic.
- Analgesic.

Actions

A potent analgesic that also causes some vasodilatation, thus reducing myocardial oxygen demand.

Indications

- Myocardial infarction.
- Acute pulmonary edema.
- Burns.
- Isolated injuries requiring pain relief.
- Sick cell crisis

Protocol Reference

B8, B9, C4, D6, G1, G2, G7, G8, G9

**Contraindications**

- Known hypersensitivity.
- Patients suspected head injury.
- Undiagnosed abdominal pain.
- Hypotension.
- Multiple trauma.

Precautions

- Have naloxone readily available in cases of respiratory depression to counteract the effects of morphine.
- Vital signs must be monitored frequently.

Adverse Reactions

- Respiratory depression.
- Apnea.
- Hypotension.
- Altered level of consciousness.
- Nausea / Vomiting.

Medication Reference:
Morphine Sulfate

Adult Dosage / Route

- 2 - 5 mg slow IV push or IM.
- Maximum of 10 mg.

Pediatric Dosage / Route

- 0.05 mg/kg slow IV push to the desired effect.
- May repeat q 5-10 minutes at $\frac{1}{2}$ initial dose.
- Maximum of 2.0 mg per dose.

Medication Reference:

Midazolam (Versed)

Class

- Sedative.
- Hypnotic.

Actions

A short acting benzodiazepine with strong hypnotic and amnestic properties.

Indications

- Pre-sedation of responsive patients prior to administration of a neuromuscular blocking agents.
- Sedation of intubated patients with ventilatory difficulty secondary to bucking or combativeness.

Protocol Reference

C4, D2, D5, G6

**Contraindications**

- Hypotension.
- Known hypersensitivity.

Precautions

The effects of midazolam can be accentuated by CNS depressants, such as narcotics and alcohol.

Adverse Reactions

- Respiratory depression.
- Apnea.
- Hypotension.
- Amnesia.

Adult Dosage / Route

- 1.0 - 2.0 mg slow IV push to the desired effect.
- Maximum of 5 mg.

**Pediatric Dosage / Route**

- 0.05 mg/kg slow IV push to the desired effect.
- Repeat q5 minutes at 1/2 initial dose as needed.